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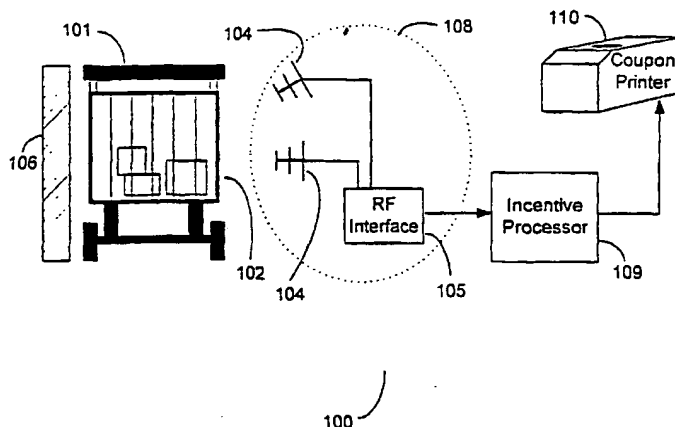
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(54) Title: PROVIDING DIRECTED MARKETING INCENTIVES USING IDENTIFICATION OF CUSTOMERS AND PURCHASE SELECTIONS THROUGH RF ID TECHNOLOGY



(57) Abstract: A method and system using Radio Frequency Identification (RFID) technology to support the issuance of targeted purchasing incentives to retail customers and supporting marketing analysis. RFID technology is used to determine the current purchase selections of a retail customer and targeted marketing incentives are given to the customer based on the current customer purchase selections either alone or in combination with prior purchase history. Customer purchase selections can be determined at various points through out the store and targeted incentives provided during the shopping visit. The current purchase selections can be optionally added to a data base for future use in selecting directed incentives or analyzing purchasing patterns to support development of marketing strategies. RFID technology, as well as other techniques, may be used to identify the customer and allow the customer's identification to be stored into the purchasing database either in association with purchase selections or to record a customer's visit to the retail establishment.



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**PROVIDING DIRECTED MARKETING INCENTIVES USING IDENTIFICATION
OF CUSTOMERS AND PURCHASE SELECTIONS THROUGH RF ID
TECHNOLOGY**

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates generally to improving selection and delivery of retail customer purchasing incentives and the technology associated with data collection to support effectiveness analysis and targeting of said incentives.

Discussion of the background

Manufacturers of products intended for retail sales are constantly trying to improve their incentive programs to retail customers in order to increase their market share and overall sales. Retail consumer incentive programs are most effective if the incentives are provided to customers who purchase competing products or indicate they are disposed to purchase a product which the manufacturer offers, but the customer has not recently purchased any product in that category. An example of the latter case is a customer who purchases cat food but no cat box litter. Such a customer indicates that he or she is disposed to purchase products in the cat box litter category either now or in the future.

Over the years, the use of bar codes has greatly increased the efficiency of generating a list of items a customer has selected for purchase in a retail store. The products which a retail customer selects are all pre-marked with "bar codes" to identify the product. The "bar codes" are printed patterns on the product or attached to the product which are readable by scanning equipment in the retail store. The list of purchase selections of a customer who is currently in the retail store is needed for purposes of determining the list of items the customer is purchasing, identifying the price of each of these items, and calculating the total amount due to the store.

Existing technology for basing marketing incentives on a customer's current purchases either alone or in combination with the customer's purchase history is based on scanning bar code information printed on the product itself. Incentives include providing customers with discount coupons or notice of in store specials. See, e.g. U. S. Patent

5,173,851. U.S. Patent No. 5,173,851 and all references cited therein are incorporated herein by reference. This existing technology is limited by the fact that each item must be physically handled and individually scanned to determine the contents of the retail customer's entire set of purchases. The physical handling of each of the customer's purchase selections limits the practical application of these techniques to the retail customer's checkout process, when the items a customer has selected for purchase must be itemized in order to determine the total cost of the purchases for payment.

Summary of the Invention

It is an object of the present invention to facilitate directing purchasing incentives to customers based upon the demonstrated purchasing patterns and purchase selections that the customer has made.

It is another object of the present invention to facilitate the identification of a retail customer and his or her purchase selections to support gathering data associating the customer with his or her purchase selections or his or her shopping visit patterns.

It is a further object of the present invention to facilitate collection of data defining a retail customer's shopping or purchase patterns in order to support targeting purchasing incentives to that customer.

It is yet another object of the present invention to improve collection of general consumer purchasing pattern data to support statistical analysis of consumer purchasing behavior.

It is yet another object of the present invention to allow improved collection of data to support characterization of purchasing incentive performance.

It is a still further object of the present invention to provide greater alternatives for structuring purchasing incentive programs.

The present invention achieves these and further objectives by using Radio Frequency Identification (RFID) stations placed at one or more points throughout a store to determine the items a retail customer has selected for purchase and which generate an electronically readable list of these purchase selections. The present invention optionally identifies the shopping cart or retail customer himself or herself and may associate the list of purchase

selections with the cart or individual to track changes in purchase selections during the shopping visit. The RFID stations determine items selected for purchase by reading RFID devices placed on each item offered for sale in the retail store. The customer may optionally carry an RFID device on his or her person to facilitate personal identification of the customer. The present invention may also analyze the lists of purchase selections in order to select purchasing incentives to provide to the customer and to analyze the effectiveness of purchasing incentives previously provided to the customer. The present invention may read and accumulate customer personal identifications to further characterize the customer's purchasing patterns. An RFID station utilized at a customer checkout and payment location allows automated application of offered purchasing incentives to further facilitate the checkout process.

Brief Description of the Drawings

Figure 1 is a schematic overview of an Radio Frequency Identification (RFID) station, along with an illustration of the equipment associated at the RFID station and a shopping cart located at the RFID station.

Figure 2 is a schematic diagram of the equipment comprising an RFID station.

Figure 3 is an illustration of the structure of an electronically readable list of items a customer has selected for purchase.

Description of the Preferred Embodiments

The preferred embodiment shown in Fig. 1 and 2 illustrates an embodiment of this invention for use in a retail store. Fig. 1 shows a Radio Frequency Identification (RFID) "station" 100 which is a location with equipment that will determine the customer's purchase selections by reading Radio Frequency Identification (RFID) devices. The customer's purchase selections are items which a customer has selected for purchase by placing them into his or her shopping cart. Fig. 1 shows a shopping cart 101, which is a particular embodiment of a purchase selection carrier, containing a plurality of items selected for purchase 102 located at an RFID station.

The items selected for purchase 102, along with all of the items offered for sale by the retail store utilizing the present invention, have Radio Frequency Identification (RFID)

devices attached to them (not shown). RFID devices are small radio frequency transponders which include a radio frequency receiver and transmitter. The RFID devices transmit a unique identification signal in response to a radio frequency "query" signal emitted by the station. Embodiments of the present invention may use RFID devices that emit signals that are different from all other RFID devices in a particular retail store and other embodiments of the present invention may use RFID devices that emit the same identification signal if they are attached to the same type of product. The latter embodiments may use RFID devices that identify products in a manner similar to the Universal Product Code (UPC) currently printed on or attached to most products offered for retail sales.

The purchase selection carrier utilized by a particular embodiment may be either a conventional shopping cart as is commonly found in grocery stores and other retail stores, or any type of product carrier utilized by the retail store. Another embodiment of this invention could allow customers to place items on a shelf or other area to allow the RFID station to read the RFID devices attached to the items if the store does not use, or the customer chooses not to use, the equivalent of a shopping cart. The following description will use the shopping cart embodiment of a purchase selection carrier.

Fig. 1 further shows that the RFID station comprises an RFID reading system 108 and an RF shield 106. The RFID reading system 108 uses RFID technology to produce an electronically readable list of purchase selections. If the RFID station is located within the retail store shopping area, the customer is free to add and remove items from the shopping cart 1 during his or her shopping visit. The RF Shield 6 is used to prevent erroneous detection of items which are outside of the customer's shopping cart 101, such as items located in other shopping carts or on store shelves.

Fig. 1 further shows that the RFID station comprises an RF interface 105. The RFID interface 105 includes a micro controller programmed to control the operations and equipment required to produce and process the required RF signals used to query the RFID devices and monitor the transmitted signals from the RFID devices attached to the items contained in the shopping cart. The operation of querying and monitoring the transmitted signals from the RFID devices is referred to herein as "reading" the RFID devices. The operation of RFID systems to determine the items a customer has selected for purchase is known to practitioners in the relevant arts. It is obvious that this invention will work with

any operational embodiment of an RFID system used to identify a plurality of products selected for purchase.

The present invention may utilize RFID stations 100 at one or more points in a retail store to determine the purchase selections a customer has made at the time of the customer's visit to an RFID station 100. When the customer presents his or her shopping cart to the RFID station 100, the RFID equipment will "read" the contents of the cart to determine the purchase selections placed into the cart. The RFID station may then issue a purchasing incentive to the customer based upon the contents of the cart, as determined by receiving the transmissions from the RFID devices. Purchasing incentives which the RFID station may offer to a customer are further defined below and include a coupon or its equivalent offering a discount on the purchase of a specified product if the product is purchased during that shopping visit. A customer may visit an RFID station several times during a shopping visit prior to checking out and paying for his or her purchases.

RFID stations 100 located within the shopping area of a retail store may communicate with the store's database of merchandise prices to determine the cost of each item contained within the cart. This would allow the RFID station 100 to calculate and display the total cost of the items determined to be in the cart along with an optional listing of items and prices of each item contained in the cart. The customer's motivation for visiting RFID stations during his or her shopping visit will be to receive purchasing incentives or to be informed of the current total price of their purchase selections. The display may be a CRT screen, or equivalent, or a printout given to the customer. The display may also contain additional information, including promotional information such as logos or other advertisements from sponsors or the retail store itself.

The present invention is able to characterize changes in customer purchase selections between multiple visits to RFID stations during the same shopping visit if the customer, or the shopping cart used by the customer, is identifiable by the RFID station. Embodiments of the present invention so identifying the customer or shopping cart may store the identification of the customer or shopping cart in association with the lists of that customer's purchase selections that are generated during different visits to RFID stations. The lists of customer purchase selections may be stored at a central location and a computer with access to the stored lists may retrieve and compare the lists generated at different times. The effectiveness

of purchasing incentives offered to the customer may be characterized by noting the changes in purchase selections read during a subsequent visit to an RFID station that is made after a purchasing incentive is offered to the customer. Changes made between visits to RFID stations may have been impacted by purchase selection offers made during a prior RFID station visit, and analysis of the changes may determine that some purchase selection changes correlate to the purchasing incentive offer. An example includes an offer incorporating a discount on a product that is a competitor to a product the customer has already chosen for purchase. If the customer has replaced the original product with the product promoted in the purchasing incentive, that is evidence of the effectiveness of the purchasing incentive.

The present invention may determine the personal identification of the customer or the identification of the shopping cart used by the customer through a variety of techniques. Personal identification of the customer may be performed by giving the customer himself or herself an RFID device which will allow the RFID station to personally identify the customer along with the items contained in the shopping cart. The present invention may also personally identify the customer by having the customer present a card or other device which is encoded with an indicia of the customer's identification as well as through other identification techniques, including biometrics. The customer may present a frequent shopper card associated with the store, a credit or debit card which the customer uses to pay for his or her purchases or a check with a checking account number identifying the checking account the customer uses to pay for purchases. The customer's telephone number, either manually entered into the RFID station or automatically read from a card or other device, is another option to personally identify the customer. The use of a customer carried RFID device is preferred since it will facilitate and expedite the operation of the RFID station and the required actions to be taken by the customer.

A retail store utilizing an embodiment of the present invention which personally identifies customers may store personal information about customers who decide to register with the store. A customer who registers with the store provides personal information to the store and is given an identification device, such as an RFID device or machine readable identification card, to allow the retail store to automatically identify the customer. The personal information provided by the customer, and stored in a database by the retail store in association with the customer's identification, includes the customer's age, family status,

number and ages of children in the household, ownership of pets, special shopper status, characterization as a frequent or infrequent visitor to the that retail store and other demographic data which may impact purchasing characteristics. Incorporating this information into the selection of purchasing incentives to offer to the customer increases the likelihood that a purchasing incentive will be selected that will motivate the customer to make the associated purchase.

A retail store using an embodiment of the present invention incorporating automatic personal customer identification may also accumulate and store lists of purchase selections in association with the customer's identification. The customer's lists of purchase selections may be accumulated over multiple visits to better characterize the customer's purchase preferences and patterns. Unique identification of a customer will allow the present invention to store lists of purchase selections made by the customer in association with the customer's identification in order to support statistical analysis of the customer's purchasing behavior, direct purchasing incentives to the customer and track redemption of purchasing incentives provided to the customer in the past. An embodiment which personally identifies the customer could include RFID stations which retrieve the stored list of customer purchases from prior visits to determine customer purchasing patterns and use these patterns in combination with the current purchase selections to determine purchasing incentives most likely to entice the customer to act.

An embodiment of the present invention incorporating automatic personal customer identification may also accumulate and store only the customer's identification without the lists of purchase selections made by that customer. Storing only the customer's identification allows the frequency of the customer's visit to the store or to RFID stations to be analyzed by the present invention. Storing the customer's identification may be augmented by storing the time of the customer's visit or the value of purchase selections made by the customer. The time stored may include the time of day of the visit, the date of the visit, or both depending upon the requirements of the data analysis later performed. If a customer's identification is read as the customer enters a retail establishment, the of the customer into the retail establishment may be recorded and correlated with purchases made during that visit or the lack of any purchases made by the customer. If the entry of customers into the retail establishment is recorded, analysis of the recorded data may be used to determine if the

customer made no purchases during that visit to the retail establishment as well as how long the customer spent in the establishment. The frequency of a customer's visit to a retail establishment without making purchases may be used to select directed incentives to that customer or be used to generally determine marketing strategies.

An alternative to personally identifying the customer himself or herself is to identify the shopping cart used by the customer. The shopping cart may be identified at the RFID station by either affixing an RFID device to each shopping cart in the retail store, or by affixing an optically readable identification to the cart and equipping the RFID station with a mechanism to read that identification. Examples of optically readable identification which could be affixed to the shopping cart include a unique bar code for each cart in the retail store or another marking which can be read with appropriate image processing. The recognition of bar codes and other symbols through the use of image processing is known to practitioners in the relevant arts.

Another alternative technique to identify a particular customer who is making multiple RFID station visits during the same shopping visit involves recording the items selected for purchase at an RFID station visit and correlating them to items read during subsequent RFID station visits. This alternative may be implemented by placing unique RFID devices on every item offered for sale in the retail store and associating subsequent RFID station generated lists that contain most of the same items as generated during a prior RFID station visit. The RFID devices used in this technique will provide a unique "serial number" to each and every item in the store, and not just identify the product's type and volume sufficient to identify the product's price and support inventory control. Since each item in the store is individually identifiable, a shopping cart containing the same items as a shopping cart scanned earlier is likely to belong to the same customer. This technique is open to error since a customer may remove most or all purchase selections from his or her shopping cart, but the technique will support data collection sufficient to support statistical analysis. If unique RFID devices are not used for each item,, and the RFID devices only support identification of the product type and volume sufficient to product price and support inventory control, this technique can still be used but will be open to greater error. An embodiment which only uses RFID devices to identify product type and volume will characterize the combination of purchase selections made by the customer and determined at

an RFID station. A shopping cart subsequently presented to an RFID station with most of the same purchase selections will be assumed to be the same shopping cart. This latter technique is open to error in identifying customers but may support marketing statistical analysis.

Embodiments of the present invention described above which identify the shopping cart used by a customer may facilitate processing by identifying the shopping cart during the checkout process and ceasing to associate that shopping cart with the customer after the customer has paid for his or her purchases.

Figure 2 schematically shows the elements of an RFID station and associated components. The RFID system controller 5 produces an electronically readable list of purchase selections. The RFID station may also identify the customer or the shopping cart used by the customer, as described above. An illustration of the structure of the data contained in the list of purchase selections is shown in Figure 3. Figure 3 illustrates an electronically readable list of two items selected for purchase, one item per row. The row elements are 1) the brand of the product; 2) the type of product (soup and milk in this example); and 3) the size of the container of the product selected for purchased. The information included in the list may include more or less than this depending upon the needs of the incentive processor 9. The list of purchase selections may be stored by the incentive processor 9 for analysis of customer purchasing patterns. If the customer or the shopping cart the customer is using is also identified at the RFID station, the incentive processor may store the list of purchase selections in association with the identification of the customer himself or herself, or the identification of the customer's cart. The stored lists of customer purchase selections may be used to direct purchasing incentives to the customer, or to support marketing analysis. The lists of purchase selections and their associated customer identifications are stored in the shopping history database 20.

The RFID station may include equipment to identify the customer presenting his or her purchase selections. If the particular embodiment of the present invention accomplishes customer identification by RFID devices, either associated with the customer, the cart used by the customer or the products contained within the cart, as described above, the RFID reading system 8 produces information used to identify the customer and supplies this information to the incentive processor 9. If customers are identified by devices not utilizing RFID techniques, the RFID station will include a customer ID reader 12 to read the customer's

identification. Equipment used to determine the identification of customers in embodiments using non-RFID customer identification techniques include equipment to optically read bar codes on the cart as well as equipment to read customer presented cards or payment tokens.

Embodiments of the present invention which determine the identity of the customer presenting a shopping cart to be read at an RFID station may utilize a broader range of techniques to select a purchasing incentive to offer a customer and also have additional flexibility in the type of promotions which can be offered. If the customer's personal identification is determined, the incentive processor 9 will be able to store lists of purchase selections in association with the customer's identification and therefore may be able to base a purchasing incentive selection upon the customer's demonstrated purchasing preferences.

Placing RFID stations throughout a store and identifying the customer or the shopping cart used by a customer allows the incentive processor to implement purchasing incentives which encourage the customer to visit different parts of the store. A purchasing incentive which would encourage the customer to visit other parts of a store would inform a customer at one RFID station that he or she will receive a particular purchasing incentive, such as a discount on a specified product, if he or she visits a specified location within the store. The customer's visit to the specified location would be a condition upon receiving the benefit of the purchasing incentive offer. The specified location may have a second RFID station located nearby and the customer's visit to the location may be verified by visiting this second RFID station. The customer may be given a notice of receiving the offer in conjunction with the reading of the customer's purchase selections by the second RFID station.

The incentive processor 9 is able to select definitions of purchasing incentives from a database of defined purchasing incentives stored in the incentive database 18. The purchasing incentive definitions stored in incentive database 18 include purchasing incentives to offer to the customer, and "events" which will trigger the offering of the purchasing incentive to a particular customer. A purchasing incentive is offered to a customer if a triggering event is observed. Triggering events may include noting that the customer has purchased a particular item or a specific combination of items. Combinations of purchased items may also occur during multiple shopping visits if the customer's identification is stored along with lists of purchase selections from prior visits. The incentive processor will examine the electronically readable list of items contained within the purchase selection

carrier, which is a shopping cart in the illustrated embodiments, and determine a purchasing incentive to offer to the customer based upon the contents of the shopping cart and optionally other factors. The incentive database 18 is periodically updated to reflect new purchasing incentives and incentive triggering events. An incentive data base and techniques used to design and implement such a database is disclosed in U.S. Patent No. 5,173,851. U.S. Patent No. 5,173,851 and all references cited therein are incorporated herein by reference.

The types of purchasing incentives which the present invention can offer to customers include providing information to the customer about products the customer may be interested in purchasing as well as offering discounted price for a specified item or combination of items. The present invention may provide information to the customer about products offered for sale in the retail store and such information may include a discounted price upon the products which is available to all customers. The present invention may choose specific products about which to inform the customer based upon interest the customer has demonstrated through his or her purchase selections. The customer's demonstrated interests may be determined through analysis of purchase selections the customer has made prior to visiting an RFID station and are currently in his shopping cart, or the customer's interests may be further determined by analysis of purchase selections made during prior shopping visits. The present invention may also present a list of suggested purchases to the customer. The suggested purchases may be based upon items already chosen for purchase by the customer, and may also be further refined by observed past purchases by that customer. The suggested purchases may include a recipe instructing the customer how to prepare a meal utilizing already purchased items and the suggested items on the list.

Purchasing incentives comprising a discounted price on a specified item will allow the customer to purchase the specified item or combination of items at a reduced price. The price discount purchasing incentive may be structured to provide a price credit based upon various purchase combinations according to the desired promotion. A price discount purchasing incentive offer can be defined by a specification of the purchasing incentive. The specification of a purchasing incentive offer defines the tow parts of the offer, the conditions of the offer and the benefit to be given upon satisfaction of the offer's conditions. The offer's conditions are the actions the customer must perform in order to receive the benefit of the purchasing incentive offer. The benefit of the purchasing incentive offer is what will be

given to the customer when he or she satisfies the conditions of the offer. An example of a specification of a purchasing incentive offer is a benefit of receiving a one dollar discount upon satisfaction of the condition that the customer purchase product X. The price discount purchasing incentive may be offered to the customer as a printed coupon or the discount may be stored in association with the customer's identification. If the customer is personally identified, the customer may receive the discount during the current or subsequent shopping visits upon identifying himself or herself. If the embodiment of the present invention only identifies the purchase selection carrier the customer is using, purchasing incentives not provided as a printed token will only be available during the current shopping visit.

The incentive processor 9 can be implemented in either a PC compatible desktop computer or in a specially designed microprocessor or application specific integrated circuit (ASIC) based controller unit. The design and development of such a controller unit is known to practitioners in the relevant arts. An example of an incentive processor is described in U.S. Patent No. 5,173,851. U.S. Patent No. 5,173,851 and all references cited therein are incorporated herein by reference.

Once the desired purchasing incentive offer is determined by the incentive processor (9), the customer is then notified of the purchasing incentive offer. The purchasing incentives provided in this embodiment include targeted coupons printed by the coupon printer 10 or a "paperless coupon," which might consist of a price adjustment for a specified item, including reduction of the price to zero - giving the customer a free item, for a specified item, if the customer purchases the specified item. The discount provided in association with a "paperless" coupon purchasing incentive offer is received automatically when the customer pays for the specified item, thereby eliminating the need to present a "paper" coupon at the time of purchase as there is with conventional coupons. The RFID station issuing a "paperless" coupon may still print a notice to the customer identifying the purchasing incentive and providing associated information or other promotional data, but the customer is not required to produce the printed message at checkout in order to receive the discount. Customers are notified of a printed coupon purchasing incentive offer when the printed coupon is provided to him or her by the RFID station. The RFID station may also have a visual display to alert the customer of the purchasing incentive offer credited to his or her account as is known to practitioners in the relevant arts.

The price adjustment data associated with a "paperless" coupon is communicated to the Point of Sale (POS) system 14 utilized by the retail store. The POS system includes a database of prices for each item offered for sale in the retail store and uses the database of prices to determine the cost of each purchased item during customer checkout. Customer checkout is herein used to describe the steps performed by the customer prior to leaving a retail store to allow the retail store to identify the items, and their costs, that the customer has selected to purchase and where the customer pays for these purchased items. The design and specification of Point of Sale system components are known to practitioners in the relevant arts. The location at which customer checkout occurs has a POS terminal which allows the operator to execute customer checkout and payment functions. POS terminals at checkout and payment locations may also incorporate RFID stations to facilitate determining customer purchase selections and distribution of purchasing incentives in conjunction with checkout and payment activities.

A retail store using an embodiment of the present invention and implementing paperless coupons includes a POS system that receives specifications of paperless coupon price adjustments for individual customers and store these purchasing incentive offer specifications in association with an identification of that customer. When the customer is paying for his or her purchase selections at the retail store checkout station, the POS system determines a second identification, which is the identification of the customer paying for his or her purchase selections, and then retrieves all purchasing incentive offers that are stored in association with that customer. The second identification may be either an identification personally identifying the customer himself or herself, or the second identification may be an identification of the purchase selection carrier used by the customer. Once the purchasing incentive offers stored in association with the customer are retrieved, the POS system then determines if the condition contained in any of the retrieved specifications of purchasing incentive offers are satisfied. If a purchasing incentive offer specification has conditions which are satisfied, the POS system will apply the associated benefit. The POS system may record the purchasing incentive benefits which were given to customers, optionally along with the total list of purchased items, in order analysis of the effectiveness of the purchasing incentive offer.

The RFID station comprises a printer 10 which is able to print paper coupons or other

notices to give to the customer. The printer 10 may print discount coupons offering the customer a purchase price discount on a specified product if the product is purchased within a given time period. Printer 10 may also simply print notices to the customer of in-store specials, such as discounts on particular items, which are available to all customers. The printer 10 could also print a suggested shopping list based upon items that the customer has already selected for purchase. A suggested shopping list could include items the customer has demonstrated an inclination to purchase by his or her current purchase selections. An example of such a suggested shopping list is a list of pet supplies to be given to customers who have purchased a pet related item. Embodiments of the present invention which store lists of purchase selections made during prior visits in association with personal customer identification can further use these stored lists of purchase selections to define a suggested shopping list.

RFID stations incorporated into checkout and purchase locations may also provide purchasing incentive offers to customers. Purchasing incentives offered at the customer checkout location may differ from purchasing incentives offered within the retail store since the goal of the former is to entice the customer to return to the store, and the goal of the latter may be primarily to entice the purchase another product during the current shopping visit. Embodiments of the present invention which include RFID stations that personally identify the customer may store payment account information associated with the customer and automatically charge that account for the customer's purchases. An embodiment of the present invention which issues RFID devices to individual customers, stores payment account information for each of these customers, identifies the customer at the checkout location and automatically charges the cost of the purchase to the stored payment account will greatly expedite and facilitate the customer checkout process.

Embodiments of the present invention which personally identify the customer to whom purchasing incentives are given are able to notify customers at their home of purchasing incentives that have been made available to them if the retail store maintains addresses for the individual customers. The retail store could use either the postal address or an e-mail address to send printed or electronic messages and advertisements to customers that have been offered purchasing incentives. The retail store will maintain a database with the address of customers to whom they will communicate the notification. Printed mailings could

include duplicate coupons or coupons directed to the customer for other products. Electronic communications could notify the customer of paperless discounts which are available to the customer as well as in-store specials available to all customers.

The present invention allows storing of the lists of purchase selections generated at the RFID stations to support gathering statistical characterizations of purchase patterns to support marketing analysis. The lists of purchase selections may be stored in association with a customer's identification if the particular embodiment determines the customer's identification in conjunction with the customer's visit to the RFID station. Storing lists of purchase selections in association with personal customer identification over many shopping visits allows the characterization of long term shopping habits for the customer which will support selecting purchasing incentives to offer to the customer that are more likely to cause the customer to respond and purchase the item specified in the purchasing incentive. The use of purchase selection history to support marketing analysis is known to practitioners in the relevant arts.

The embodiment shown in Figure 2 illustrates the major components of the embodiment as contained in separate units or machines. This is not a requirement of the invention, and the various elements could be combined into fewer machines, be distributed among various machines differently, or, in fact, be contained in a single machine with a single computer. Embodiments utilizing such redistributions can be designed by practitioners in the relevant arts.

Obviously, numerous modifications and variations of the present invention are possible in light of the above teachings. It is therefore to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described herein.

Claims:

1. A computer implemented method of directing purchasing incentives to a customer and for supporting marketing analysis, comprising the steps of:
 - receiving a plurality of radio frequency signals from a corresponding plurality of radio frequency transmission devices, each one of said signals containing data identifying a unique item contained within a plurality of items a customer has selected for purchase;
 - determining an incentive to be offered to a person in dependence upon at least one of said plurality of items; and
 - notifying said customer of said incentive offer.
2. A method according to claim 1 wherein the steps of receiving and notifying occur prior to a transaction in which said customer purchases any of said plurality of unique items.
3. A method as set forth in claim 1 wherein said steps of receiving and notifying occur in conjunction with customer checkout activities.
4. A method as set forth in claim 1, further comprising the steps of:
 - calculating a total cost of said plurality of items said customer has selected for purchase;
 - and
 - displaying said total cost.
5. A method as set forth in claim 4, wherein said step of displaying said total cost further comprises displaying promotional information.
6. A method as set forth in claim 1 wherein said incentive comprises a printed list of in-store specials and said step of notifying comprises printing said printed list of in-store specials for said customer.
7. A method as set forth in claim 1 wherein said incentive comprises a printed list of a plurality of suggested purchases, said plurality of suggested purchases selected in dependence upon said plurality of items.
8. A method as set forth in claim 1, wherein said incentive offer has a precondition

- requiring said customer to visit a different store location.
9. A method as set forth in Claim 1 wherein said incentive comprises a printed coupon and said step of notifying comprises printing said coupon for said customer.
10. A method as set forth in claim 9 further comprising the steps of:
- storing a list of said plurality of items and a specification of said incentive into a computer database;
 - storing the use of said printed coupon into said computer database;
 - and
 - analyzing the contents of said database to determine marketing statistics.
11. A method as set forth in claim 1, further comprising the steps of:
- determining a first identification associated with said customer;
 - storing, into a computer database, a specification of said incentive in association with said first identification;
 - determining a second identification associated with a second customer during a purchase transaction in which said second customer purchases a second set of items;
 - retrieving from said database a set of retrieved incentives, said set of retrieved incentives comprising specifications of incentives stored in association with said second identification;
 - and
 - in response to determining that said second set of items satisfies a specific condition contained in said set of retrieved incentives, applying a benefit associated with satisfying said specific condition.
12. A method as set forth in claim 11, further comprising the steps of:
- recording a first list specifying said plurality of items and said incentive in association with said first identification;
 - determining a second identification associated with a second customer;
 - in conjunction with said step of determining a second identification, generating a second list of a second set of purchase selections, wherein said step of

generating is based upon receiving a plurality of signals from Radio Frequency Identification devices associated with items said second customer has selected for purchase;

and

characterizing the effectiveness of said incentive by determining the difference in purchase selections between said first list and said second list and attributing those difference to said incentive.

13. A method as set forth in claim 11, wherein said step of determining a first identification comprises the step of personally identifying said customer.
14. A method as set forth in claim 13, wherein the step of personally identifying comprises reading a personal radio frequency identification device carried by said customer.
15. A method as set forth in claim 13 wherein said step of personally identifying comprise reading an identification card presented by said customer.
16. A method as set forth in claim 13 wherein said step of personally identifying comprises determining an account associated with said customer.
17. A method as set forth in claim 16 wherein said account is one of:
 - a checking account,
 - a credit card account
 - a debit card account, and
 - a telephone account.
18. A method as set forth in Claim 16 further comprising the steps of:
 - calculating a total cost for said second set of purchase selections;
 - and
 - charging said total cost to said account.
19. A method as set forth in Claim 13 further comprising the steps of:
 - storing the home address of said first customer;
 - and
 - mailing a notification of said incentive to the home of said first customer.

20. A method as set forth in Claim 13 further comprising the steps of:
- storing the internet e-mail or other electronic communications address of said first customer;
- and
- communicating a notification of said incentive to the home of said first customer by internet e-mail or other electronic communications.
21. A method as set forth in claim 11 wherein said step of determining an identification comprises the step of uniquely determining a purchase selection carrier used by said customer.
22. A method as set forth in claim 21 wherein said step of uniquely determining a purchase selection carrier comprises reading a Radio Frequency Identification device affixed to the purchase selection carrier.
23. A method as set forth in claim 21 wherein said step of uniquely determining a purchase selection carrier comprises recording a list specifying said plurality of unique items that are contained within said purchase selection carrier.
24. A method as set forth in claim 23 wherein each of said radio frequency signals uniquely distinguish individual items from similar items.
25. A method as set forth in claim 23 wherein said step of uniquely determining a purchase selection carrier comprises reading a unique and optically readable insignia affixed to the purchase selection carrier.
26. A method as set forth in claim 25 wherein said unique and optically readable insignia comprises a bar code.
27. A computer implemented method for directing purchasing incentives to a customer and for supporting marketing analysis, comprising the steps of:
- generating an electronically readable list of a set of purchase selections made by said customer, wherein said step of generating is based upon receiving a plurality of signals from Radio Frequency Identification devices associated with items a customer has selected for purchase;
- determining an identification personally identifying said customer;
- storing said electronically readable list into a computer database in association with

said identification;

determining an incentive to provide to said customer, wherein said step of
determining an incentive comprises

- (1) retrieving a set of stored lists from said computer database,
wherein said set of stored lists comprises a plurality of
purchase selection lists that are stored in association with said
identification, and
- (2) depending said incentive upon said set of purchase selections
and additional purchase selections contained in said set of
stored lists;

and

notifying said customer of said incentive.

28. A method as set forth in claim 27 wherein said identification comprises a personal
radio frequency identification device carried by said customer.
29. A method as set forth in claim 27 wherein said identification comprises an
identification card presented by said customer.
30. A method as set forth in claim 27 wherein said identification comprises an account
associated with said customer.
31. A method as set forth in claim 30 wherein said account is one of:
a checking account,
a credit card account,
a debit card account, and
a telephone account.
32. A method as set forth in Claim 30 further comprising the steps of:
calculating a total cost for said set of purchase selections;
and
charging part or all of said total cost to said account.
33. A method as set forth in Claim 27 further comprising the steps of:
storing a home address of said retail customer;

and

mailing an additional incentive to the home of said first customer

34. A method as set forth in claim 33 wherein said additional incentive comprises one or both of
- advertisements, and
- discount coupons.
35. A method as set forth in claim 33 wherein said additional incentive is selected in conjunction with analysis of said set of stored lists.
36. A method as set forth in Claim 27 further comprising the steps of:
- storing a internet e-mail or other electronic communications address of said first customer;
- and
- communicating an additional incentive to the home of said first customer by e-mail or other electronic communications.
37. A method as set forth in claim 36 wherein said incentives comprise one or both of
- advertisements, and
- discount coupons.
38. A method as set forth in claim 36 wherein said additional incentive is selected in conjunction with analysis of said set of stored lists.
39. A method as set forth in claim 27, further comprising the steps of:
- storing a specification of said incentive in association with said identification;
- determining a second identification associated with a second customer during a purchase transaction in which said second customer purchases a second set of items;
- during payment for a second set of items by said second customer, retrieving a set of stored incentives, wherein said set of stored incentives comprises all specifications of incentives stored in association with said second identification;
- and

- in response to determining that said second set of items satisfies a specific condition contained in said set of retrieved incentives, applying a benefit associated with satisfying said specific condition.
40. A computer implemented method for directing purchasing incentives to a customer and for supporting marketing analysis, comprising the steps of:
- determining an identification personally identifying said customer during a shopping visit, said identification determined by receiving a signal from a radio frequent identification device associated with said customer;
 - storing said identification into a shopping history database;
41. A method as set forth in claim 40 further comprising the steps of:
- determining an incentive to provide to said customer, wherein said step of determining an incentive comprises analyzing said customer history database;
 - and
 - notifying said customer of said incentive.
42. A method as set forth in claim 40 wherein said step of storing further comprises storing a total purchase price of a purchase made by said customer in association with said identification.
43. A method as set forth in claim 40 wherein said step of storing further comprises storing a time indication of said shopping visit in association with said identification.
44. A method as set forth in claim 40 wherein said identification comprises a personal radio frequency identification device carried by said customer.
45. A method as set forth in claim 40 wherein said identification comprises an identification card presented by said customer.
46. A method as set forth in claim 40 wherein said identification comprises an account associated with said customer.
47. A method as set forth in claim 46 wherein said account is one of:
- a checking account,
 - a credit card account,

- a debit card account, and
 - a telephone account.
48. A method as set forth in Claim 46 further comprising the steps of:
- calculating a total cost for said set of purchase selections;
 - and
 - charging part or all of said total cost to said account.
49. A method as set forth in Claim 46 further comprising the steps of:
- storing a home address of said retail customer;
 - and
 - mailing an additional incentive to the home of said first customer
50. A method as set forth in claim 49 wherein said additional incentive comprises one or both of
- advertisements, and
 - discount coupons.
51. A method as set forth in claim 49 wherein said additional incentive is selected in conjunction with analysis of said set of stored lists.
52. A method as set forth in Claim 40 further comprising the steps of:
- storing a internet e-mail or other electronic communications address of said first customer;
 - and
 - communicating an additional incentive to the home of said first customer by e-mail or other electronic communications.
53. A method as set forth in claim 52 wherein said incentives comprise one or both of
- advertisements, and
 - discount coupons.
54. A method as set forth in claim 52 wherein said additional incentive is selected in conjunction with analysis of said set of stored lists.
55. A system for directing purchasing incentives to a customer and for supporting marketing analysis, comprising:

means for receiving a plurality of radio frequency signals from a corresponding plurality of radio frequency transmission devices, each one of said signals containing data identifying a unique item contained within a plurality of items a customer has selected for purchase;

means for determining an incentive to be offered to a person in dependence upon at least one of said plurality of items; and

means for notifying said customer of said incentive offer.

56. A system according to claim 55 wherein the means for receiving and notifying operate prior to a transaction in which said customer purchases any of said plurality of unique items.
57. A system as set forth in claim 55 wherein said means for receiving and notifying operate in conjunction with customer checkout activities.
58. A system as set forth in claim 55, further comprising:
 - means for calculating a total cost of said plurality of items said customer has selected for purchase;
 - and
 - means for displaying said total cost.
59. A system as set forth in claim 58, wherein said means for displaying said total cost further comprises means for displaying promotional information.
60. A system as set forth in claim 55 wherein said incentive comprises a printed list of in-store specials and said means for notifying comprises means for printing said printed list of in-store specials for said customer.
61. A system as set forth in claim 55 wherein said incentive comprises a printed list of a plurality of suggested purchases, said plurality of suggested purchases selected in dependence upon said plurality of items.
62. A system as set forth in claim 55, wherein said incentive offer has a precondition requiring said customer to visit a different store location.
63. A system as set forth in Claim 55 wherein said incentive comprises a printed coupon and said means for notifying comprises means for printing said coupon for said customer.

64. A system as set forth in claim 63 further comprising:
- means for storing a list of said plurality of items and a specification of said incentive into a computer database;
 - means for storing the use of said printed coupon into said computer database;
 - and
 - means for analyzing the contents of said database to determine marketing statistics.
65. A system as set forth in claim 55, further comprising:
- means for determining a first identification associated with said customer;
 - means for storing, into a computer database, a specification of said incentive in association with said first identification;
 - means for determining a second identification associated with a second customer during a purchase transaction in which said second customer purchases a second set of items;
 - means for retrieving from said database a set of retrieved incentives, said set of retrieved incentives comprising specifications of incentives stored in association with said second identification;
 - and
 - means for applying a benefit associated with satisfying said specific condition, wherein said means for applying a benefit operates in response to determining that said second set of items satisfies a specific condition contained in said set of retrieved incentives.
66. A system as set forth in claim 65, further comprising:
- means for recording a first list specifying said plurality of items and said incentive in association with said first identification;
 - means for determining a second identification associated with a second customer;
 - means for generating a second list of a second set of purchase selections which operates in conjunction with said means for determining a second identification, and wherein said means for generating utilizes reception of a plurality of signals from Radio Frequency Identification devices associated

with items said second customer has selected for purchase;

and

means for characterizing the effectiveness of said incentive by determining the difference in purchase selections between said first list and said second list and attributing those difference to said incentive.

67. A system as set forth in claim 65, wherein said means for determining a first identification comprises means for personally identifying said customer.
68. A system as set forth in claim 67, wherein the means for personally identifying comprises means for reading a personal radio frequency identification device carried by said customer.
69. A system as set forth in claim 67 wherein said means for personally identifying comprises means for reading an identification card presented by said customer.
70. A system as set forth in claim 67 wherein said means for personally identifying comprises means for determining an account associated with said customer.
71. A system as set forth in claim 70 wherein said account is one of:
 - a checking account,
 - a credit card account
 - a debit card account, and
 - a telephone account.
72. A system as set forth in Claim 70 further comprising:
 - means for calculating a total cost for said second set of purchase selections;
 - and
 - means for charging said total cost to said account.
73. A system as set forth in Claim 67 further comprising:
 - means for storing the home address of said first customer;
 - and
 - means for mailing a notification of said incentive to the home of said first customer.
74. A system as set forth in Claim 67 further comprising:

a database storing the internet e-mail or other electronic communications address
of said first customer;

and

means for communicating a notification of said incentive to the home of said first
customer by internet e-mail or other electronic communications.

75. A system as set forth in claim 65 wherein said means for determining an identification comprises means for uniquely determining a purchase selection carrier used by said customer.
76. A system as set forth in claim 75 wherein said means for uniquely determining a purchase selection carrier comprises means for reading a Radio Frequency Identification device affixed to the purchase selection carrier.
77. A system as set forth in claim 75 wherein said means for uniquely determining a purchase selection carrier comprises means for recording a list specifying said plurality of unique items that are contained within said purchase selection carrier.
78. A system as set forth in claim 77 wherein each of said radio frequency signals uniquely distinguish individual items from similar items.
79. A system as set forth in claim 77 wherein said means for uniquely determining a purchase selection carrier comprises means for reading a unique and optically readable insignia affixed to the purchase selection carrier.
80. A system as set forth in claim 79 wherein said unique and optically readable insignia comprises a bar code.
81. A computer implemented system for directing purchasing incentives to a customer and for supporting marketing analysis, comprising:
- means for generating an electronically readable list of a set of purchase selections made by said customer, wherein said means for generating utilizes reception of a plurality of signals from Radio Frequency Identification devices associated with items a customer has selected for purchase;
 - means for determining an identification personally identifying said customer;
 - means for storing said electronically readable list into a computer database in association with said identification;

means for determining an incentive to provide to said customer, wherein said

means for determining an incentive comprises

(1) means for retrieving a set of stored lists from said computer database, wherein said set of stored lists comprises a plurality of purchase selection lists that are stored in association with said identification, and

(2) means for depending said incentive upon said set of purchase selections and additional purchase selections contained in said set of stored lists;

and

means for notifying said customer of said incentive.

82. A system as set forth in claim 81 wherein said identification comprises a personal radio frequency identification device carried by said customer.

83. A system as set forth in claim 81 wherein said identification comprises an identification card presented by said customer.

84. A system as set forth in claim 81 wherein said identification comprises an account associated with said customer.

85. A system as set forth in claim 84 wherein said account is one of:

a checking account,

a credit card account,

a debit card account, and

a telephone account.

86. A system as set forth in Claim 84 further comprising:

means for calculating a total cost for said set of purchase selections;

and

means for charging part or all of said total cost to said account.

87. A system as set forth in Claim 81 further comprising:

a database storing a home address of said retail customer;

and

means for mailing an additional incentive to the home of said first customer

88. A system as set forth in claim 87 wherein said additional incentive comprises one or both of

advertisements, and

discount coupons.

89. A system as set forth in claim 87 wherein said additional incentive is selected in conjunction with analysis of said set of stored lists.

90. A system as set forth in Claim 81 further comprising:

a database storing an internet e-mail or other electronic communications address of said first customer;

and

means for communicating an additional incentive to the home of said first customer by e-mail or other electronic communications.

91. A system as set forth in claim 90 wherein said incentives comprise one or both of advertisements, and

discount coupons.

92. A system as set forth in claim 90 wherein said additional incentive is selected in conjunction with analysis of said set of stored lists.

93. A system as set forth in claim 81, further comprising:

a databases storing a specification of said incentive in association with said identification;

means for determining a second identification associated with a second customer during a purchase transaction in which said second customer purchases a second set of items;

means for retrieving a set of stored incentives during payment for a second set of items by said second customer, said set of stored incentives consisting of all specifications of incentives stored in association with said second identification;

and

means for applying a benefit associated with satisfying said specific condition in response to determining that said second set of items satisfies a specific condition contained in said set of retrieved incentives.

94. A computer implemented system for directing purchasing incentives to a customer and for supporting marketing analysis, comprising:
- means for determining an identification personally identifying said customer during a shopping visit, said identification determined by receiving a signal from a radio frequent identification device associated with said customer;
 - means for storing said identification into a shopping history database;
95. A system as set forth in claim 94 further comprising:
- means for determining an incentive to provide to said customer, wherein said means for determining an incentive comprises means for analyzing said customer history database;
 - and
 - means for notifying said customer of said incentive.
96. A system as set forth in claim 94 wherein said means for storing further comprises means for storing a total purchase price of a purchase made by said customer in association with said identification.
97. A system as set forth in claim 94 wherein said means for storing further comprises means for storing a time indication of said shopping visit in association with said identification.
98. A system as set forth in claim 94 wherein said identification comprises a personal radio frequency identification device carried by said customer.
99. A system as set forth in claim 94 wherein said identification comprises an identification card presented by said customer.
100. A system as set forth in claim 94 wherein said identification comprises an account associated with said customer.
101. A system as set forth in claim 100 wherein said account is one of:
- a checking account,

- a credit card account,
 - a debit card account, and
 - a telephone account.
102. A system as set forth in Claim 100 further comprising:
- means for calculating a total cost for said set of purchase selections;
 - and
 - means for charging part or all of said total cost to said account.
103. A system as set forth in Claim 100 further comprising:
- means for storing a home address of said retail customer;
 - and
 - means for mailing an additional incentive to the home of said first customer
104. A system as set forth in claim 103 wherein said additional incentive comprises one or both of
- advertisements, and
 - discount coupons.
105. A system as set forth in claim 103 wherein said additional incentive is selected in conjunction with analysis of said set of stored lists.
106. A system as set forth in Claim 94 further comprising:
- a database for storing a internet e-mail or other electronic communications address of said first customer;
 - and
 - means for communicating an additional incentive to the home of said first customer by e-mail or other electronic communications.
107. A system as set forth in claim 106 wherein said incentives comprise one or both of
- advertisements, and
 - discount coupons.
108. A system as set forth in claim 106 wherein said additional incentive is selected in conjunction with analysis of said set of stored lists.

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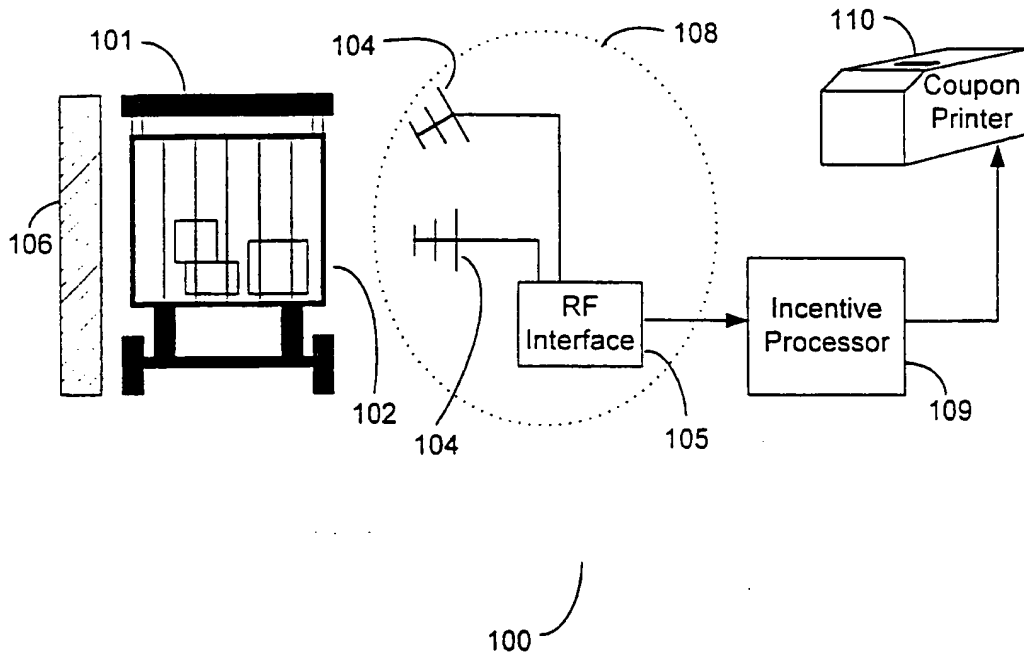


Fig. 1

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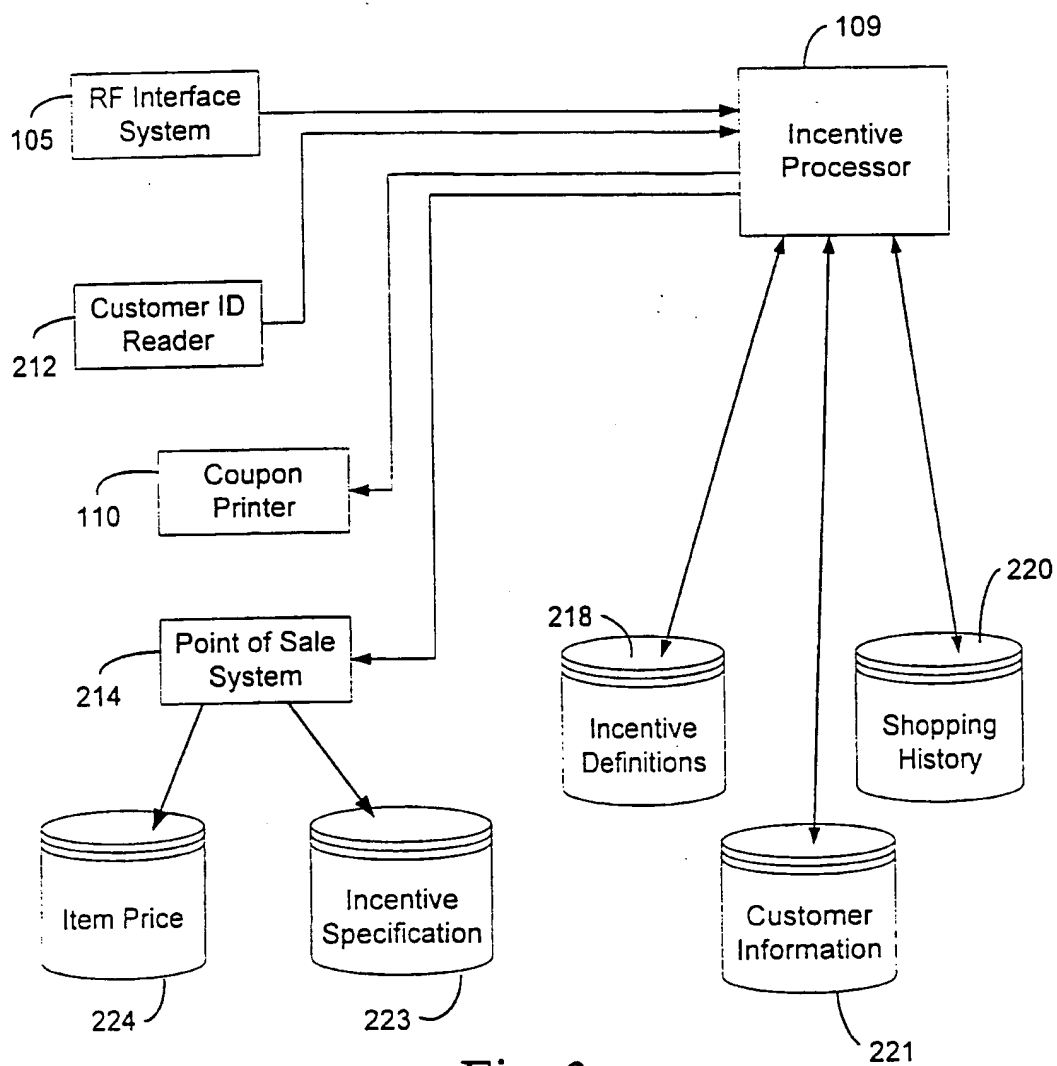


Fig. 2

<brand x><soup><12 oz>
<brand y><milk><64 oz>

Fig. 3

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